

Claims:

1. A communication system for implementing personalizable and customizable features, comprising:
 - 5 a tuple space; and
 - a plurality of user agents representing said features, said user agents communicating with each other via assertions posted to said tuple space in order to implement said features while avoiding feature interactions, each of said features being structured as a set of deontic task trees having a parent node with an obliged inherent
 - 10 action and a plurality of child nodes with respective node actions performed according to a predetermined sequence, the results of which are reported back to said parent node, said parent node placing deontic modalities on the behavior of said child nodes such that successful implementation of said feature results from successful occurrence of said inherent action and composed success of the node actions of said children nodes.
- 15 2. A communication system as claimed in claim 1, wherein said parent node is provided with a sequence operator defining said predetermined sequence.
3. A communication system as claimed in claim 1 or claim 2, wherein said node
- 20 actions include an ASK action for placing an assertion in said tuple space seeking permission to perform an intended action, waiting a period of time for replies from any other features that subscribe to said assertion, and thereafter either continuing with or discontinuing said intended action based on an internal policy based on said replies.
- 25 4. A communication system as claimed in claim 1 or claim 2, wherein said node actions include an atomic STATE action for placing an assertion in said tuple space notifying all subscribing features of an intention to perform an intended action, and thereafter continuing with said intended action.
- 30 5. A communication system as claimed in claim 1 or claim 2, wherein said node actions include an ACT action for placing an assertion in said tuple space that performs an action in said communication system.

6. A communication system as claimed in claim 1 or claim 2, wherein said node actions include an OBSERVE action for placing an assertion in said tuple space to monitor events indicating one of either states within said communication system or requests from other agents for its actions.

7. A communication system as claimed in claim 2, wherein said sequence operator is selected from the group consisting of:

- PARALLEL – wherein all child nodes are triggered simultaneously and said parent node waits for a response from each child node before reporting one of either successful implementation or failure of said feature;
- SEQUENCE – wherein said child nodes are triggered in sequence from left to right and said parent node waits for a response from each child node before reporting one of either successful implementation or failure of said feature;
- FORK – wherein said child nodes are triggered simultaneously and said parent node waits for a first response from one of said child nodes before reporting one of either successful implementation or failure of said feature.
- CHOICE – wherein said child nodes are triggered in sequence from left to right and said parent node waits for a first response from one of said child nodes before reporting one of either successful implementation or failure of said feature; and
- SELECT – wherein each child node becomes associated with a predicate based on the value of a fact in an assertion in said tuple space and only the child node that contains the first predicate deemed true is triggered, and in the event that no child is triggered the parent node assumes a non-occurrence from the child nodes.

8. A communication system as claimed in any one of claims 1 to 7, wherein said deontic modalities include Obligated, meaning the associated action must occur in order to be successful; Interdicted, meaning the associated action must not occur to be successful; and Permitted, meaning the associated action need not occur to be successful.

9. A communication system as claimed in any one of claims 1 to 8, wherein said assertions to said tuple space include:

Scope, to name said assertions for subscription by a node;

Fact, to convey information about a user;

Task, to define a goal that a sender action requires a receiver action to perform; and

Modulator, to place a constraint on the execution of the goal that a sender action has sent.

- 5 10. In a communication system having a tuple space and a plurality of user agents representing features, said user agents communicating with each other via assertions posted to said tuple space in order to implement said features, each of said features being structured as a set of deontic task trees having a parent node with an obliged inherent action and a plurality of child nodes with respective node actions performed according to a
- 10 predetermined sequence, the results of which are reported back to said parent node such that successful implementation of said feature results from successful occurrence of said inherent action and composed success of the node actions of said children, the improvement comprising placing permitted deontic modalities on the behavior of at least one of said child nodes so as to avoid spurious feature interactions.

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11. A system as claimed in claim 1 and substantially as hereinbefore described with reference to or as illustrated in the accompanying Figures 1 to 5 inclusive.
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